PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

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Applicant's or agent's file reference	FOR FURTHER ACTION	See Form PCT/IPEA/416
14836-10PCT		
International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/CA2004/000397	19.03.2004	20.03.2003
International Patent Classification (IPC) or national classification and IPC		
H01C17/26		
Applicant		
MICROBRIDGE TECHNOLOGIES INC. et al.		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 9 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
   a. ☒ *sent to the applicant and to the International Bureau)* a total of 13 sheets, as follows:
      ☒ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
      ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
   b. ☐ *(sent to the International Bureau only)* a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

☒	Box No. I	Basis of the opinion
☐	Box No. II	Priority
☒	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
☐	Box No. IV	Lack of unity of invention
☒	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
☐	Box No. VI	Certain documents cited
☒	Box No. VII	Certain defects in the international application
☒	Box No. VIII	Certain observations on the international application

Date of submission of the demand	Date of completion of this report
23.12.2004	06.06.2005
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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/CA2004/000397

Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

   ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
   - ☐ international search (under Rules 12.3 and 23.1(b))
   - ☐ publication of the international application (under Rule 12.4)
   - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

Description, Pages	
1-33	as originally filed
Claims, Numbers	
1-82	filed with telefax on 30.03.2005
Drawings, Sheets	
1/18-18/18	as originally filed

   ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☐ The amendments have resulted in the cancellation of:
   - ☐ the description, pages
   - ☐ the claims, Nos.
   - ☐ the drawings, sheets/figs
   - ☐ the sequence listing *(specify)*:
   - ☐ any table(s) related to sequence listing *(specify)*:

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
   - ☐ the description, pages
   - ☐ the claims, Nos.
   - ☐ the drawings, sheets/figs
   - ☐ the sequence listing *(specify)*:
   - ☐ any table(s) related to sequence listing *(specify)*:

* *If item 4 applies, some or all of these sheets may be marked "superseded."*

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/CA2004/000397

Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application,

☒ claims Nos. 17-49,64-82

because:

☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (specify):

☒ the description, claims or drawings *(indicate particular elements below)* or said claims Nos. 17-49,64-82 are so unclear that no meaningful opinion could be formed *(specify)*:

see separate sheet

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

☐ no international search report has been established for the said claims Nos.

☐ the nucleotide and/or amino acid sequence listing does not comply with the standard provided for in Annex C of the Administrative Instructions in that:

the written form	☐	has not been furnished
	☐	does not comply with the standard
the computer readable form	☐	has not been furnished
	☐	does not comply with the standard

☐ the tables related to the nucleotide and/or amino acid sequence listing, if in computer readable form only, do not comply with the technical requirements provided for in Annex C-*bis* of the Administrative Instructions.

☐ See separate sheet for further details

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/CA2004/000397

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-16,50-63
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-16,50-63
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-82
	No:	Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Re Item III

Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. Claims 17 - 49 and 64 - 82 are not clear and, hence, do dot comply with the requirements set forth in Article 6 PCT.

1.1. Claim 17 attempts to define the subject-matter in terms of the result to be achieved ("... specifying physical parameters for said component **to obtain** said trimmable range for said resistance and said trimmable range for said temperature coefficient ..."), which merely amounts to a statement of the underlying problem, without providing the technical features necessary for achieving this result.

1.2. The term "decison-making-module" in claim 33 is unclear, since it leaves the reader in doubt, **which** decisions are made and **how** the decisions are made, in order to achieve the object of the invention.

1.3. Also Claim 64 attempts to define the subject-matter in terms of the result to be achieved ("... is set ..."), which merely amounts to a statement of the underlying problem, without providing the technical features necessary for achieving this result.

It should be noted, that the features of claim 65 are not suitable to clarify claim 64. Claim 65 attempts to define a product (the circuit) by its manufacturing process. However, in the present case it is not possible to distinguish a circuit with a resistor known from document *D1*, having a particular resistance value and a praticular TCR value, from a circuit with a resistor, whose TCR is adjusted to this particular resistance value and to this particular TCR value in accordance with the method of any one of claims 1 - 32.

1.4. Claims 18 - 32, 34 - 49 and 65 - 82 are also unclear, because they are referred back to unclear claims 17, 33 and 64, respectively.

2. In view of the foregoing, it is impossible to give a reasoned statement under Rule 66.2(a)(ii) with regard to novelty and inventive step for claims 17 - 49 and 64 - 82.

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Reference is made to the following document:

D1: BABCOCK J A ET AL: "Polysilicon resistor trimming for packaged integrated circuits" ELECTRON DEVICES MEETING, 1993. TECHNICAL DIGEST., INTERNATIONAL WASHINGTON, DC, USA 5-8 DEC. 1993, NEW YORK, NY, USA,IEEE, 5 December 1993 (1993-12-05), pages 247-250, XP010118446 ISBN: 0-7803-1450-6

2.1. The document *D1* is regarded as being the closest prior art to the subject-matter of claim 1 and shows (the references in parentheses applying to this document):

A method for adjusting the resistance, R, of a thermally mutable resistor material (figure 5) and a method for adjusting the temperature coefficient of change of the resistance, TCR, of said resistor (figure 3). This method comprises as a matter of course the trivial steps of

- selecting a target resistance value (or a TCR value)
- trimming the resistance value (or the TCR value) until it is substanially equal to the target resistance value (or the target TCR value, respectively)

2.2. The subject-matter of claim 1 differs from this known method in that

the resistance value **and** the TCR value are trimmed **independently** to their target values by

- trimming the resistance value until it is substantially equal to the target resistance value
- trimming the TCR value until it is substanially equal to the target TCR value, while maintaining the resistance value substantially equal to the target resistance value

by cycling the resistance away from and back to the target resistance value, thereby using a R-TCR-hysteresis characteristics of the thermally mutable resistor material.

2.3. The subject-matter of claim 1 is therefore new (Article 33(2) PCT).

2.4. The problem to be solved by the present invention may be regarded as

providing a method for trimming the resistance value **and** the TCR value of a thermally mutable resistor material **independently**.

2.5. The solution to this problem proposed in claim 1 of the present application is considered as involving an inventive step (Article 33(3) PCT) for the following reasons:

The documents cited in the International Search Report do not suggest, that the resistance value and the TCR value of a thermally mutable resistor material can be trimmed independenty by the proposed method, because these documents do not teach a R-TCR-hysteresis characteristics of the thermally mutable resistor material.

2.6. Claims 2 - 16 are dependent on claim 1 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

3. For the same reasons as given in paragraph 2. above, the subject-matter of claim 50 and claims 51 - 63, dependent on claim 50, is new and involves an inventive step.

Re Item VII

Certain defects in the international application

1. Independent claims 1, 17, 33, 50 and 64 are not in the two-part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate, with those features known in combination from the prior art being placed in the preamble (Rule 6.3(b)(I)

PCT) and with the remaining features being included in the characterising part (Rule 6.3(b)(ii) PCT).

2. The features of all claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

Re Item VIII

Certain observations on the international application

1. The application does not meet the requirements of Article 6 PCT, because claims 1 - 82 are not clear.

2.1. Throughout the whole description there are no other electrical components mentioned than resistors. Hence, the term "electrical components" as used in independent claims 1, 17, 33, 50 and 64 renders the scope of these claims broader than justified by the description. Therefore, said claims are not supported by the description as required by Article 6 PCT.

2.2. For the discussion under item V the term "electrical components" is interpreted as "resistors".

3.1. The term "micro-platform" as used in claims 6, 8, 11, 24, 26, 29, 37, 38, 39, 45, 60, 62, 78, 79 and 81 is unclear, since it is not well-defined and, hence, open to arbitrary interpretation. In particular, it leaves the reader in doubt as to the size and the structure of the "micro-platform".

3.2. For the discussion under item V the term "micro-platform" is interpreted as a "platform suspended over a depression", as shown in figures 9 and 10.

4. Also claims 2 - 16, 18 - 32, 34 - 49, 51 - 63 and 65 - 82 are unclear, since they are referred back to unclear claims.

* * *

WHAT IS CLAIMED IS:

1. A method for adjusting resistance of an electrical component made of a thermally mutable material and temperature coefficient of change of said resistance, said thermally mutable material possessing a hysteresis characteristic with respect to a dependence of said temperature coefficient on said resistance, the method comprising:

selecting a target resistance value;

selecting a target temperature coefficient independent from said target resistance value and within a range of temperature coefficient values available for said target resistance value;

trimming said resistance value until said resistance value is substantially equal to said target resistance value; and

trimming said temperature coefficient until said temperature coefficient is substantially equal to said target temperature coefficient, while maintaining said resistance value substantially equal to said target resistance value by cycling said resistance value away from and back towards a starting point, thereby using said hysteresis characteristic of said thermally mutable material.

2. A method as claimed in claim 1, wherein said trimming said resistance comprises applying a heating cycle, and said heating cycle comprises a sequence of heat pulses to trim said resistance value in a first direction and a sequence of heat pulses to trim said resistance value in an opposite direction.

3. A method as claimed in any one of claims 1 and 2, wherein said trimming said temperature coefficient comprises selecting parameters of said heating cycle to determine a direction of trimming and an amount of trimming of said temperature coefficient.

4. A method as claimed in claim 3, wherein said selecting parameters comprises selecting a first heat pulse of said sequence of heat pulses of said heating cycle to be of a given amplitude to determine a change in said temperature coefficient.

5. A method as claimed in any one of claims 3 to 4, wherein said electrical component is a resistor.

6. A method as claimed in any one of claims 3 to 5, wherein said electrical component is on a thermally isolated micro-platform on a substrate.

7. A method as claimed in claim 6, wherein a resistive heating element is provided for generating said sequence of heat pulses.

8. A method as claimed in claim 7, wherein said heating element is on said thermally isolated micro-platform.

9. A method as claimed in claim 4, wherein said trimming said temperature coefficient comprises driving said temperature coefficient down by using a first pulse above a temperature coefficient reversal threshold, and driving said temperature coefficient up using pulses below said threshold.

10. A method as claimed in any one of claims 2 to 9, wherein said trimming said temperature coefficient comprises applying a plurality of heating cycles.

11. A method as claimed in any one of claims 9 to 10, wherein said electrical component is on a thermally isolated micro-platform.

12. A method as claimed in any one of claims 1 to 11, wherein said resistance and said temperature coefficient can be measured at room temperature before applying a succeeding heat pulse.

13. A method as claimed in claim 12, wherein said temperature coefficient is measured during a cooling of said component with respect to an arbitrary scale, and said target temperature coefficient is substantially zero.

14. A method as claimed in claim 12, wherein said target temperature coefficient corresponds to a non-zero relative temperature coefficient.

15. A method as claimed in claim 4, wherein said trimming said resistance comprises providing at least one pulse just above a trimming temperature threshold to precision-trim said resistance while obtaining a negligible change in said temperature coefficient.

16. A method as claimed in any one of claims 1 to 15, wherein said component is part of a bridge circuit and said trimming said resistance creates a balanced state of said bridge circuit.

17. A method for providing a circuit, the method comprising:

designing said circuit including at least one thermally-mutable component having a target resistance value and a target temperature coefficient of resistance value independent from said target resistance value, the thermally-mutable component being made of a material possessing a hysteresis characteristic with respect to a dependence of said temperature coefficient on said resistance;

identifying a nominal resistance value having a trimmable range for said resistance including said target resistance value and a trimmable range for said temperature coefficient of resistance including said target temperature coefficient of resistance;

specifying physical parameters for said component to obtain said trimmable range for said resistance and said trimmable range for said temperature coefficient; and

manufacturing said circuit on a substrate wherein said component has said nominal resistance value.

18. A method as claimed in claim 17, further comprising:

trimming said nominal resistance value to be substantially equal to said target resistance value; and

trimming said temperature coefficient of resistance to be substantially equal to said target temperature coefficient of resistance value.

19. A method as claimed in claim 18, wherein said specifying physical parameters comprises specifying a position of said component in said circuit and dimensions of said component.

20. A method as claimed in claim 18, wherein said trimming said nominal resistance comprises applying a heating cycle, and said heating cycle comprises a sequence of heat pulses to trim said resistance value in a first direction and a sequence of heat pulses to trim said resistance value in an opposite direction.

21. A method as claimed in any one of claims 18 to 20, wherein said trimming said nominal temperature coefficient comprises selecting parameters of said heating cycle to determine a direction of trimming and an amount of trimming.

22. A method as claimed in claim 21, wherein said selecting parameters comprises selecting a first heat pulse of said sequence of heat pulses of said heating cycle to be of a given amplitude to determine a change in said temperature coefficient.

23. A method as claimed in any one of claims 21 to 22, wherein said electrical component is a resistor.

24. A method as claimed in any one of claims 21 to 23, wherein said electrical component is on a thermally isolated micro-platform on a substrate.

25. A method as claimed in claim 24, wherein a resistive heating element is provided for generating said sequence of heat pulses.

26. A method as claimed in claim 25, wherein said heating element is on said thermally isolated micro-platform.

27. A method as claimed in claim 22, wherein said trimming said temperature coefficient comprises driving said temperature coefficient down by using a first pulse above a temperature coefficient reversal threshold, and driving said temperature coefficient up using pulses below said threshold.

28. A method as claimed in any one of claims 20 to 27, wherein said trimming said temperature coefficient comprises applying a plurality of heating cycles.

29. A method as claimed in any one of claims 20 to 28, wherein said electrical component is on a thermally isolated micro-platform and wherein said resistance and said temperature coefficient can be measured at room temperature before applying a succeeding heat pulse.

30. A method as claimed in claim 29, wherein said temperature coefficient is measured during a cooling of said component with respect to an arbitrary scale, and said target temperature coefficient is substantially zero.

31. A method as claimed in claim 20, wherein said trimming said resistance comprises providing at least one pulse just above a trimming temperature threshold precision-trim said resistance while obtaining a negligible change in said temperature coefficient.

32. A method as claimed in any one of claims 17 to 31, wherein said component is part of a bridge circuit and said trimming said resistance creates a balanced state of said bridge circuit.

33. An apparatus for trimming a temperature coefficient of resistance of an electrical component made from a thermally mutable material possessing a hysteresis

characteristic with respect to a dependence of said temperature coefficient on said resistance, the apparatus comprising:

a substrate having a portion for thermally-isolating said electrical component;

heating circuitry having a decision-making module adapted to apply heating cycles to said component, each of said heating cycles comprising a sequence of heat pulses to trim a resistance value in a first direction and a sequence of heat pulses to trim said resistance value in an opposite direction, and wherein each heating cycle trims said temperature coefficient of resistance by an increment by cycling said resistance value away from and back towards a starting point, thereby using said hysteresis characteristic of said thermally mutable material; and

measuring circuitry adapted to measure said resistance and said temperature coefficient of resistance.

34. An apparatus as claimed in claim 33, wherein said decision-making module is adapted to determine an amplitude of a heat pulse, a duration of said heat pulse, and a time interval before a succeeding heat pulse.

35. An apparatus as claimed in any one of claims 33 to 34, wherein said heating circuitry comprises a heating element for heating said electrical component.

36. An apparatus as claimed in any one of claims 33 to 35, wherein said electrical component is a resistor.

37. An apparatus as claimed in any one of claims 33 to 36, wherein said substrate has a thermally-isolated micro-platform for said electrical component.

38. An apparatus as claimed in claim 37, wherein said heating element is on said thermally isolated micro-platform.

39. An apparatus as claimed in claim 37, wherein said heating element is on a second thermally isolated micro-platform in close proximity to said electrical component.

40. An apparatus as claimed in any one of claims 33 to 39, wherein said decision-making module determines said amplitude of a heat pulse, duration of said heat pulse, and time interval before a succeeding heat pulse as a function of a history of pulses applied to said electrical component.

41. An apparatus as claimed in any one of claims 33 to 40, wherein said component is part of a bridge circuit, and said apparatus is for adjusting said temperature coefficient of a bridge output.

42. An apparatus as claimed in any one of claims 33 to 41, wherein said heating circuitry generates said heating cycle for trimming said temperature coefficient.

43. An apparatus as claimed in claim 42, wherein said heating cycle comprises a sequence of pulses to trim said resistance in a first direction and a sequence of pulses to trim said resistance in an opposite direction.

44. An apparatus as claimed in claim 43, wherein said decision-making module determines an amplitude of a first pulse of said sequence of pulses to determine a direction and an amount to trim of said temperature coefficient.

45. An apparatus as claimed in claim 33, wherein said electrical component is a first resistor and it resides on a first thermally-isolated micro-platform, and further comprising a second resistor made from a thermally-mutable material and residing on a second thermally-isolated micro-platform; wherein said heating circuitry comprises a first resistive heating element on said first thermally-isolated micro-platform and a second resistive heating element on said second thermally-isolated micro-platform; and wherein said measuring circuitry comprises a central resistive heating element placed on a third thermally-isolated micro-platform substantially symmetrically between said first resistor and said second resistor such that heating through said central resistive element results in a substantially symmetric temperature rise in said first resistor and

said second resistor.

46. An apparatus as claimed in claim 45, further comprising two additional resistors connected to said first resistor and said second resistor, such that a Wheatstone bridge is formed.

47. An apparatus as claimed in any one of claims 45 and 46, wherein said thermally mutable material is polysilicon.

48. An apparatus as claimed in any one of claims 45 to 47, wherein said central resistive element is made of polysilicon.

49. An apparatus as claimed in any one of claims 45 to 48, wherein said measuring circuitry and said calculating circuitry are on a same chip as said substrate.

50. A method for trimming a temperature coefficient of resistance of at least one electrical component made from a thermally mutable material possessing a hysteresis characteristic with respect to a dependence of said temperature coefficient on said resistance, while maintaining a substantially constant resistance value, the method comprising applying a heating cycle to trim said resistance value away from a target resistance value and back to said target resistance value, wherein the temperature coefficient of resistance is modified after applying said heating cycle by cycling said resistance value away from and back towards a starting point, thereby using said hysteresis characteristic of said thermally mutable material.

51. A method as claimed in claim 50, wherein applying the heating cycle comprises using a first set of pulses to trim away from said target resistance value and pulses of amplitudes lower than said first set of pulses to trim back to said target resistance value.

52. A method as claimed in claim 51, wherein said heating cycle comprises at

least one heating pulse having a first amplitude, followed by a plurality of heating pulses having amplitudes lower than said first amplitude.

53. A method as claimed in claim 52, wherein said plurality of heating pulses have varying amplitudes.

54. A method as claimed in claim 53, wherein each of said plurality of heating pulses has an amplitude equal to or lower than an amplitude of a previous pulse.

55. A method as claimed in any one of claims 50 to 54, further comprising applying a second heating cycle to continue trimming said temperature coefficient of resistance.

56. A method as claimed in claim 55, wherein said second heating cycle comprises a first pulse of equal or greater amplitude than a first pulse of a previous heating cycle.

57. A method as claimed in any one of claims 50 to 56, further comprising applying a plurality of subsequent heating cycles to further trim said temperature coefficient of resistance to a target temperature coefficient of resistance.

58. A method as claimed in claim 57, wherein said applying a plurality of subsequent heating cycles comprises trimming said temperature coefficient of resistance below said target temperature coefficient of resistance and gradually increasing said temperature coefficient of resistance to said target temperature coefficient of resistance.

59. A method as claimed in any one of claims 50 to 58, wherein said electrical component is a resistor.

60. A method as claimed in any one of claims 50 to 59, wherein said electrical component is on a thermally isolated micro-platform on a substrate.

61. A method as claimed in claim 60, wherein a resistive heating element is provided for generating said heating cycle.

62. A method as claimed in claim 61, wherein said heating element is on said thermally isolated micro-platform.

63. A method as claimed in any one of claims 50 to 62, wherein said at least one electrical component is a pair of matched resistors, and said temperature coefficient of resistance is a relative temperature coefficient of resistance.

64. A circuit comprising at least one electrical component made of a thermally mutable material possessing a hysteresis characteristic with respect to a dependence of said temperature coefficient on said resistance, defined by an upper limit and a lower limit of resistance, and having a temperature coefficient of resistance; characterized in that said resistance is set to a predetermined target resistance value and said temperature coefficient of resistance is set to a predetermined target temperature coefficient of resistance value independent of said target resistance value.

65. A circuit as claimed in claim 64, wherein said resistance and said temperature coefficient of resistance are adjusted in accordance with the method of any one of claims 1 to 32.

66. A circuit as claimed in any one of claims 64 to 65, wherein said predetermined target resistance value and said predetermined target temperature coefficient of resistance are set to respect an overall predetermined circuit state.

67. A circuit as claimed in any one of claims 64 to 66, wherein said at least one component comprises at least two components having a substantially matched

resistance value, and wherein said predetermined temperature coefficient of resistance value is a relative temperature coefficient of resistance between said at least two components.

68. A circuit as claimed in claim 67, wherein said substantially matched resistance value of said two components has a tolerance value no greater than 50 ppm.

69 A circuit as claimed in claim 67, wherein said substantially matched resistance value of said two components has a tolerance value no greater than 200 ppm.

70. A circuit as claimed in any one of claims 67 to 69, wherein said relative temperature coefficient of resistance of said two components has a tolerance value no greater than 50 ppm/K.

71. A circuit as claimed in any one of claims 67 to 69, wherein said relative temperature coefficient of resistance of said two components has a tolerance value no greater than 10 ppm/K.

72. A circuit as claimed in any one of claims 67 to 71, wherein said relative temperature coefficient of resistance of said two components is less than 3% of an as-manufactured temperature coefficient of resistance value of one of the two components.

73. A circuit as claimed in any one of claims 64 to 66, wherein said at least one component comprises at least two components and said target resistance value is a ratio between said at least two components, and wherein said matched resistance value of said at least two components has a tolerance value no greater than 200 ppm of said ratio.

74. A circuit as claimed in any one of claims 64 to 73, wherein said at least one component comprises at least two components and said predetermined temperature coefficient of resistance value is a relative temperature coefficient of resistance between

said at least two components, and said relative temperature coefficient of resistance of said at least two components is a desired non-zero relative difference from each other, and has a tolerance value no greater than 10ppm/K.

75. A circuit as claimed in any one of claims 64 to 74, wherein said circuit is one of a balanced bridge circuit, a calibrated amplifier, and a calibrated sensor system.

76. A circuit as claimed in any one of claims 67 to 75, wherein said at least two components are a pair of resistors connected in series, and wherein said target temperature coefficient of resistance is a relative temperature coefficient equal to substantially zero.

77. A circuit as claimed in any one of claims 64 to 76, wherein said at least one component is a resistor.

78. A circuit as claimed in any one of claims 64 to 77, wherein said at least one component is on at least one thermally-isolated micro-platform.

79. A circuit as claimed in claim 78, further comprising a heating element on said at least one thermally-isolated micro-platform.

80. A circuit as claimed in claim 79, further comprising a second thermally-isolated micro-platform having a second electrical component made from a thermally mutable material and a second heating element.

81. A circuit as claimed in claim 80, further comprising a central resistive heating element on a third thermally-isolated micro-platform substantially symmetrically between said at least one electrical component and said second electrical component such that heating through said central resistive element results in a substantially symmetric temperature rise in said at least one electrical component and said second electrical component.

82. A circuit as claimed in any one of claims 64 to 81, wherein said at least one component is made of polysilicon.